BLOCK READ AND WRITE ROUTINE FOR UNIVAC III CONVENTION TAPE

1.0 CONTENTS

This document is preliminary in nature and is intended as a vehicle for meeting immediate needs with regard to system familiarization and orientation. UNIVAC® Division of Sperry Rand Corporation reserves the right to change and/or modify such information contained herein as may be required by subsequent system developments.

2.0 INTRODUCTION

There are two program components involved in the use of the tape block control routines: the calling statement and the macro instructions. The calling statement directs the assembler to incorporate a particular configuration of the block control routine coding into the worker program. The configuration of coding incorporated depends upon the values of the parameters in the calling statement. The macro instructions are used by the worker program to communicate with the routine generated by the calling statement.

3.0 BLOCK READ

The purpose of the block read routine is to provide a basic framework for reading blocks from tape. All communications with the Executive and tape control are included in the called routine. Single reel processing only is provided.

3.1 DESCRIPTION

The block read routine assumes the use of index register one. It will put in this index register the relative address of the first character of the current data block. (This will be the first character of a data descriptor word for modes 4 or 5.) No label or reel number checking is done by the routine. Standard UNIVAC III sentinel checking is done for modes 4 and 5. No sentinel checking at all is supplied for mode 3.

The user supplies his own area statement in the following form:

LABEL	OP'N	OPERANDS
XTPIN	AREA	s_1,,,1

where s_1 is the size of the area. Rules for the calculation of area size are found in Section 4.2 of the UNIVAC III Convention Tape I/O document, UP 3940.24. The 1 in the above expression is the index register specified. See AREA statement in Section 4.1 of UP 3940.24 for the other parameters.

3.2 CALLING STATEMENT FOR BLOCK READ ROUTINE

LABEL	OP'N	OPERANDS
	*TPIN	p_1,p_2,p_3p_4,p_5,p_6

Label This field must be blank.

p_1 Tape unit assigned to file.

p_2 Mode (3, 4 or 5).

p_3 Maximum block size (including 4 control characters). (See Section 4.2, UP 3940.24).

p_4 Number of blocks that file area can contain (1 or 2).

p_5 Label of a closed subroutine for processing block count errors. This parameter is for real time users only (see the paragraph below).

p_6 RT, specifies priority for block read tape orders in a real time system (refer to the OPR Executive document UP 3940.14 for a further discussion of the priority option).

Block Count Error (mode 4 and 5 users) - The user who wishes to have access to the computer block count and the tape block count, as well as notification that there is a block count error, should supply a label for parameter 5. When *TPIN accesses his subroutine the computer block count is found in tetrad 0, the tape block count in tetrad 1. The display stop 014uu03 (where u is the unit number), normally associated with this error will be found in the five locations following the jump return to the users subroutine. The user will therefore wish to add a binary 5 to his exit line if he wishes to ignore the error and return control to *TPIN.

3.3 TAPE READ MACRO

LABEL	OP'N	OPERANDS
	*TPRD	

3.3.1 Entrance Requirements

None.

3.3.2 Exit Conditions

a. When the user wants to get any block from the tape, including the first, he issues the above macro call.

b. For modes 4 and 5, when an end of reel or end of file sentinel is sensed, the tape is rewound with interlock. At either end of reel or end of file the routine jumps to an instruction labeled XEND in the users program. The user is responsible for supplying this labeled instruction.

c. When the macro instructions return control to the worker program, the number of characters in the current block, except for block 1, will be found in the least significant three characters of AR1, and the address of the first character of the block in IR1.

d. A block count is kept in a four character location labeled XIXT2.

3.3.3 Storage Requirement

Five characters.

4.0 BLOCK WRITE

The purpose of the block write routine is to provide a basic framework for writing blocks on tape. All communications with the Executive Routine and tape control are included in the called routine.

4.1 DESCRIPTION

The block write routine appropriates index register two and will put there the relative starting address of the current output block. Labels are not written by the routine but provision to do so is made for the user. The user must supply his own area statement in the following form:

LABEL	OP'N	OPERANDS
XTOUT	AREA	s_1,,,2

where s_1 is the size of the area. Rules for calculating the area size are given in Section 4.2 of UP 3940.24. The 2 in the above expression is the index register specified. See AREA (Section 4.1 of UP 3940.24) for description of the other parameters.

4.2 CALLING STATEMENT FOR BLOCK WRITE ROUTINE

LABEL	OP'N	OPERANDS
	*TOUT	p_1,p_2,p_3,p_4,p_5

Label This field must be blank.

p_1 Tape unit assigned to file.

p_2 Mode (3, 4, or 5).

p_3 Maximum block size (including 4 control characters).

p_4 Number of blocks which file area can contain (1 or 2).

p_5 RT, specifies priority for block write tape orders in a real time system (refer to the OPR Executive description UP 3940.14).

4.3 TAPE WRITE INITIALIZE MACRO

LABEL	OP'N	OPERANDS
	*INIT	

4.3.1 Entrance Requirement

The first macro to be used must be the above initializing section.

4.3.2 Exit Conditions

a. A jump return to a closed subroutine labeled XOWN in the users program will be executed to enable the user to set up his first block. When mode 4 or 5 has been specified and control is returned to the called routine, this block will be written as a 60 character block in 5 character mode unless the user makes the following change before returning:

To write in mode 4

```
LABEL    OP'N    OPERANDS
         SC      XTXT2+3,Ø
```

When mode 3 has been specified and control is returned to the called routine, the block will be written as a 60 character block in 3 character mode.

b. The block size in characters for the block may be adjusted by changing the 3 character field XTXK1 to the appropriate correct size for his first block. This can be accomplished by,

```
LABEL    OP'N    OPERANDS
         FT      s,3
         SA1     XTXK1,3
```

where s is the number of characters to be written.

c. Index register two will contain the relative address of the first character of the current output block when control is returned from *INIT to the worker program.

4.3.3 Storage Requirement

Five characters.

4.4 TAPE WRITE MACRO

```
LABEL    OP'N    OPERANDS
         *TPWRT
```

4.4.1 Entrance Requirements

INIT has been executed.

4.4.2 Exit Conditions

a. The previous block is not available to the worker program as the tape order has been initiated.

b. Should the user wish to change the number of characters to be written he may do so by executing the following instructions before calling on TPWRT. The block size will remain at the altered size until changed again. The instructions are,

```
LABEL    OP'N    OPERANDS
         FT      s,3
         SA1     XTXT5,3
```

where s equals the number of characters to be written on tape; s must conform to hardware rules of integral divisibility by the mode.

c. The relative starting address of the new current output block will be in index register two upon exit from *TPWRT.

4.4.3 Storage Requirement

Five characters.

4.5 CLOSE MACRO

```
LABEL    OP'N    OPERANDS
         *FINAL
```

4.5.1 Entrance Requirement

None.

4.5.2 Exit Conditions

a. A block count is kept in a 4 character location labeled XTXTØ. It is preset to 060000000 for ease in UNIVAC III sentinel handling.

b. This macro is used by mode 4 or 5 users to write UNIVAC III end of file sentinels and rewind the tape with interlock. Any mode 4 or 5 users who do not wish standard sentinels may execute the following instructions before calling for *FINAL:

LABEL	OP'N	OPERANDS
	SC	XTX36+4,32
	SC	XTX36+9,0

In this case only the rewind is executed.

c. Mode 3 users should use the same macro, *FINAL, without any modifying line, which will cause the tape to rewind with interlock.

d. In the event that the program has not called for *FINAL before the physical end of tape is sensed, the routine will automatically come to a stop display 0150u07, where u is replaced by the octal representation of the unit involved. For mode 4 and 5 users end of reel sentinels will have been written on tape and the tape rewound with lock. Mode 4 and 5 users may process the next reel of tape by depressing the PROGRAM START button. *INIT will be executed and control passed back to user.

4.5.3 Storage Requirement

Five characters.